

B-1. INTRODUCTION

To properly assess the environmental impact of an action, a variety of factors must be reviewed. In cases where adequate information is lacking to enable a definite environmental evaluation, it may be necessary to make provisions to obtain actual environmental effect data, especially since the current CEQ guidelines require that a statement:

"...should also succinctly describe the environment of the area affected as it exists prior to the proposed action."

It goes without saying that the better the assessment, the closer the Navy will be to achieving the goal as outlined in the CEQ guidelines for environmental impact statements.

The following paragraphs list factors which could be considered in determining whether an action has an environmental impact, or could become environmentally controversial. The listings should aid in evaluating the nature and degree of the impact, as well as in identifying other agencies which have an interest in the action. Since the listings should not be considered to be complete, those persons assessing actions and preparing or reviewing environmental statements will have to use a great deal of imagination in order to objectively consider the wide range of beneficial and detrimental environmental aspects.

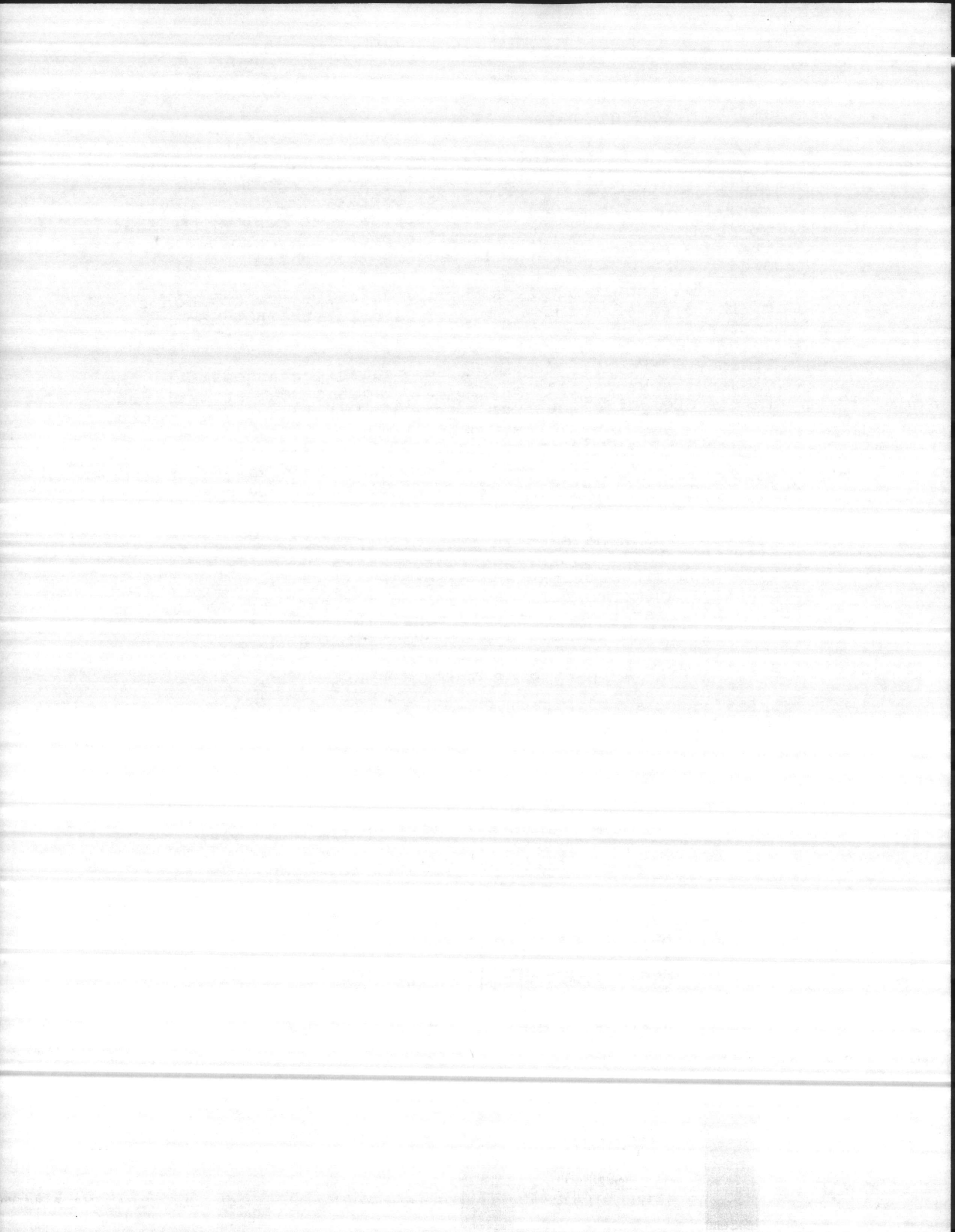
B-2. ACTION SUMMARY STATEMENT

Brief statement describing what the action is and why it has to be accomplished.

B-3. ACTION SCHEDULE

Time schedule for the action and for those events preceding the action, which may have an environmental impact.

- a. Date of initiating request for approval
- b. Anticipated date of action approval
- c. Action design or planning phase
- d. Begin construction phase (or similar preparatory actions)
- e. End construction phase (e.g., complete engine test cell)



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f. Anticipated date of activity initiation (e.g., begin engine testing)

g. Anticipated date of activity completion

B-4. EXISTING ACTION SITE CHARACTERISTICS

Various factors of background information about the local area where the action is to take place.

a. Demographic Factors

(1) Station Population (identifying numbers that live on board)

- (a) Military
- (b) Dependents
- (c) Civilian employees

(2) Area Population

- (a) Total population
- (b) Growth trends
- (c) Seasonal variations
- (d) Comparable density estimates
- (e) Estimate of affected population

b. Governmental Organizations

(1) Local

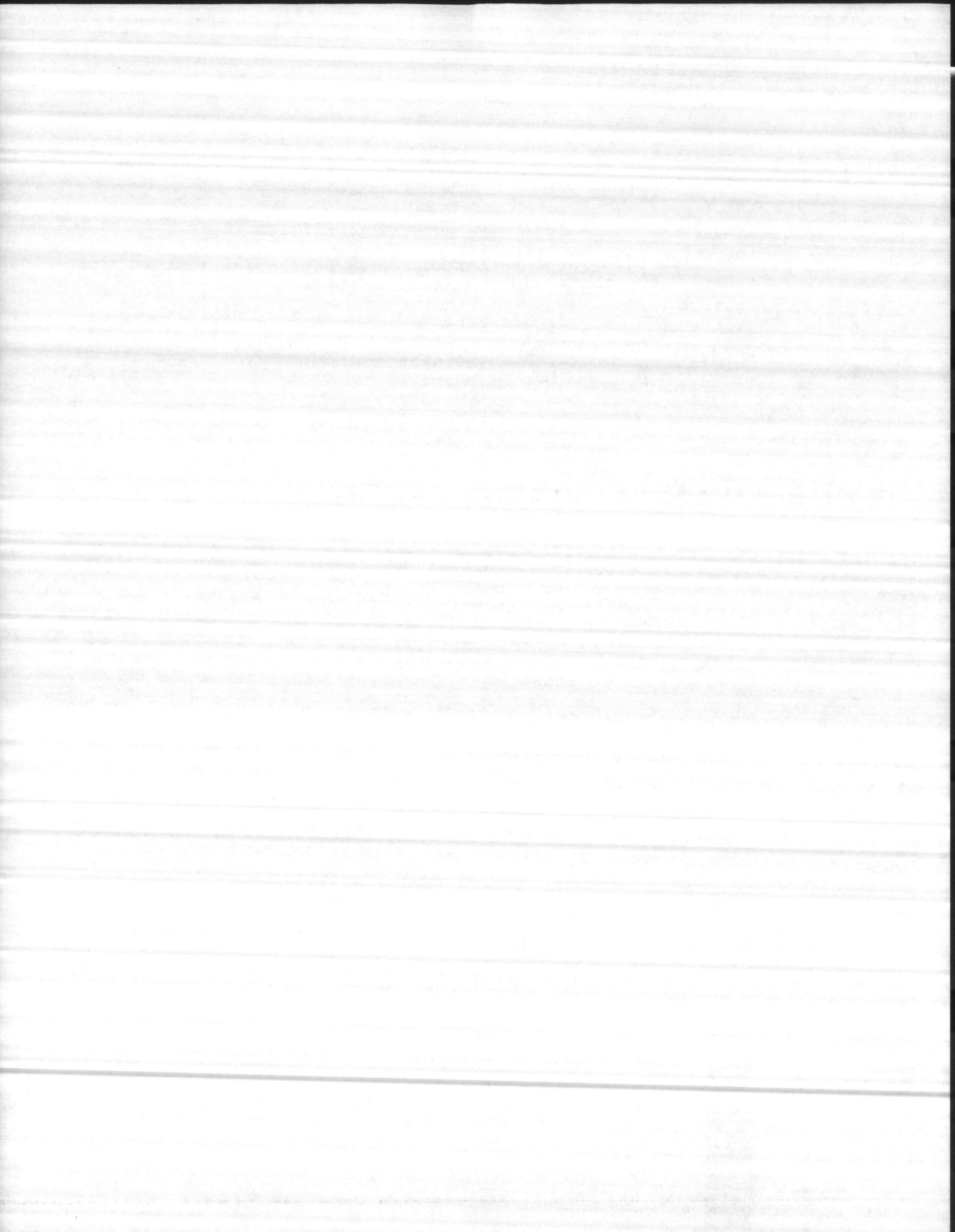
(2) County

(3) Council of Governments

(4) Regional Planning Commissions

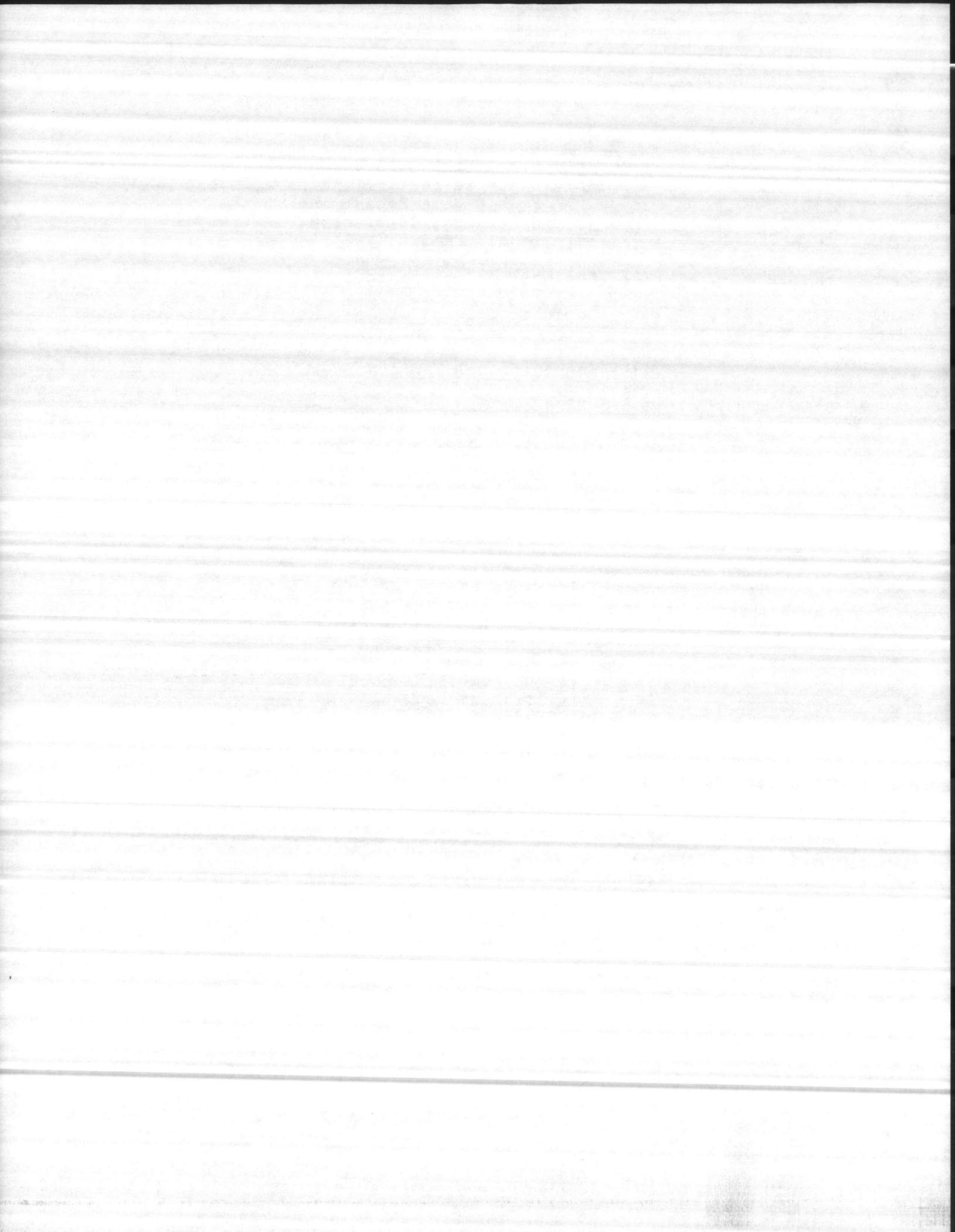
(5) State Government, i.e.,

- (a) Utilities Commissions
- (b) Natural Resources Board
- (c) State Land Commission
- (d) Department of Pollution Control
- (e) State Transportation Department
- (f) State Agricultural Department
- (g) Water Resources Control Board
- (h) State Planning Officer
- (i) Consumer Services
- (j) Water Management Districts
- (k) Air Quality Control Commission



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- (l) Water Quality Control Commission
 - (m) Public Health Department
 - (n) State Highway Department
 - (o) State Recreation and Parks Department
 - (p) Fish & Game Department
 - (q) Historical Commission
 - (r) Legal Affairs (Attorney General)
- (6) Regional & Interstate Authorities
- (7) Regional & Local Offices of Federal Agencies with Jurisdiction and/or Special Expertise
- (8) International Implications
- c. Socio-Economic and Cultural Factors
- (1) Population Socio-Economic Characteristics
 - (a) Rural
 - (b) Urban
 - (2) Project Area Economic Base
 - (a) Principal area resources
 - (b) Navy role in area economics
 - (c) Median income levels:
 - Military & civilian personnel associated with the Navy in the area
 - Civilian population
 - (d) Area tax revenue resources
 - (e) Federal aid to the area - sources
 - (3) Aesthetic Aspects
 - (a) Area landscaping effort
 - (b) Architectural features and styles
 - (c) Existence of signs, blighted areas and congestion in action area
 - (4) Historical and Archeological Sites
 - (5) Special Interest Groups Associated with the Action Site
 - (6) Area Housing and Medical Situation
 - (7) Area Educational Institutions
 - (8) Area Transportation Network



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- (9) Utilization of Area Park, Woodlands and Recreation Facilities

d. Physical Characteristics

(1) Geography

- (a) General project setting
(b) Geographic extent of project effect:
Boundaries of military property
Critical locations that lie outside
military property but within
effects zone

(2) Topography

- (a) General characteristics, slope,
covering, etc.
(b) Details on critical features that have
project implications

(3) Geology

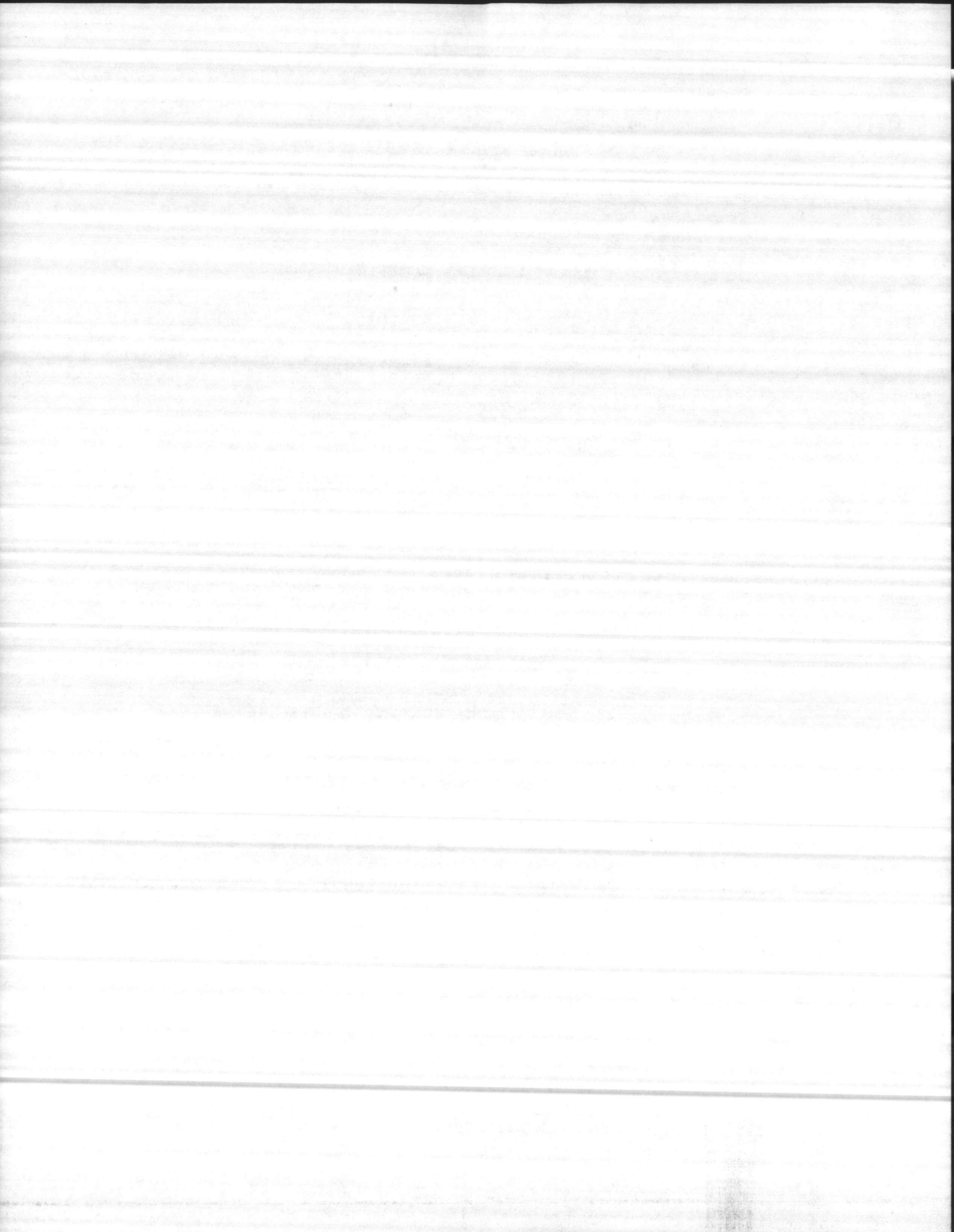
- (a) Soil characteristics:
Texture, in place density and
depth
Particle, size distribution and
stratification
Porosity, permeability and
capillarity
Plasticity and cohesion
Chemical and radioactive material
constituents
Erosion characteristics
- (b) Geologic formations:
Bedding sequence and charac-
teristics
Mineral resources
Permeability and ground water
resources
Pertinent water quality aspects

(c) Seismology

(d) Silt/silting

(4) Meteorology and Climatology

- (a) Precipitation:



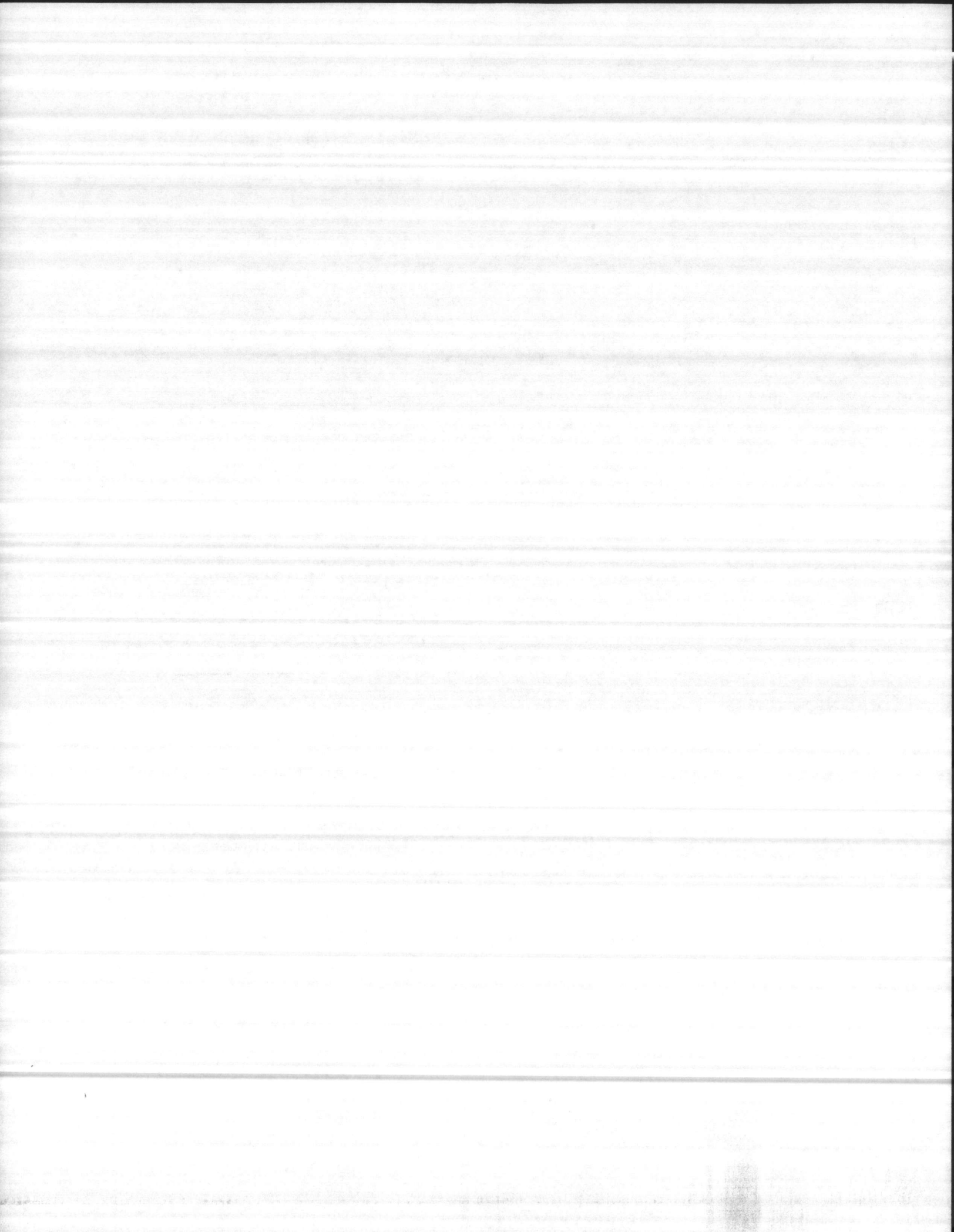
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Minimum, maximum, mean, median-daily, seasonally and yearly
Variability

- (b) Relative humidity
- (c) Air temperature:
Daily and monthly - minimum, maximum, and mean
Variability, spatially and temporarily
- (d) Wind speed and direction
- (e) Excessive condition possibilities
- (f) Solar radiation; inversion frequency and elevation
- (g) Visibility
- (h) Airborne particulate and gaseous pollutants:
CO, CO₂, NO_x, SO_x, O₃
Photo chemical oxidants, hydrocarbons
Particulate: soot, asbestos, oxides of beryllium and lead, etc.

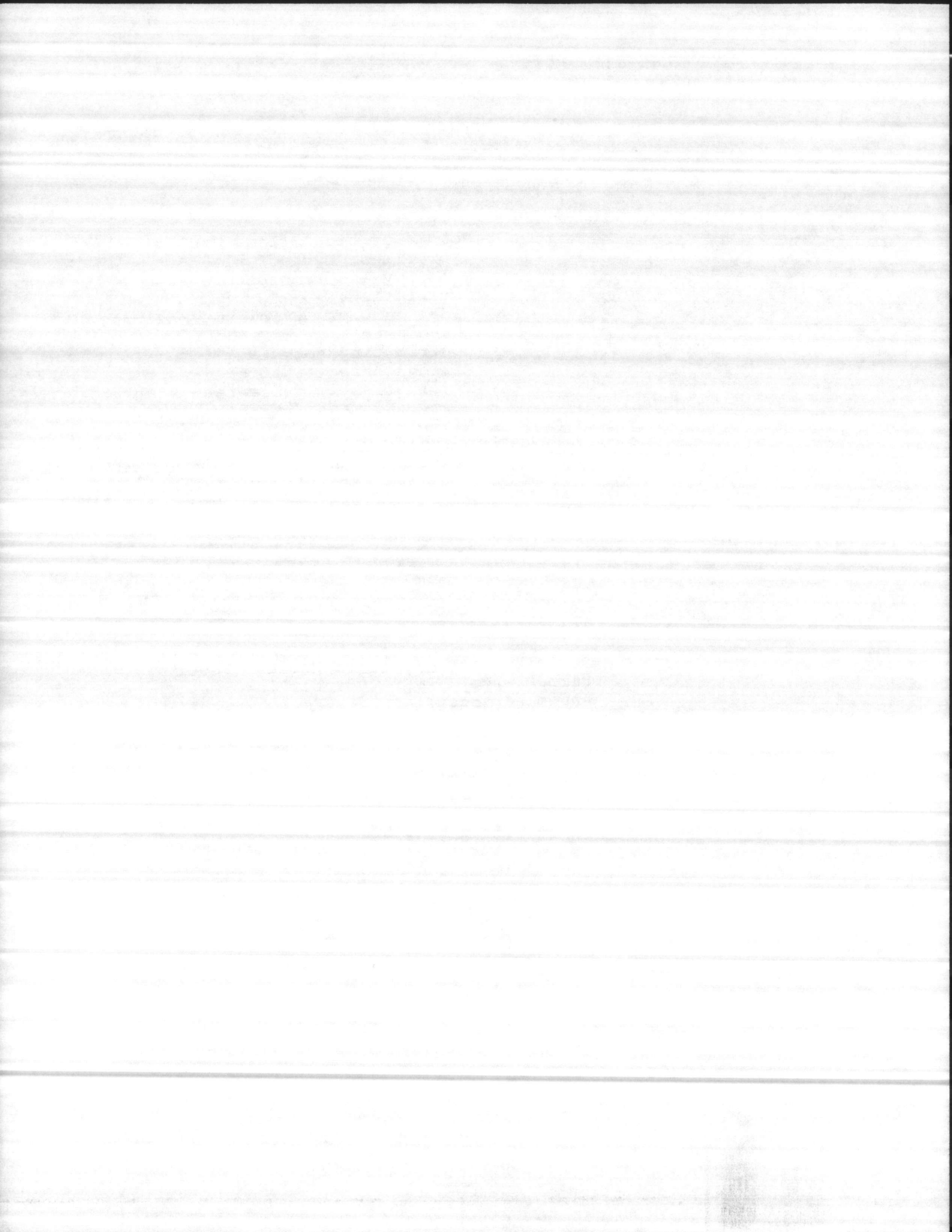
(5) Hydrology

- (a) Stream discharge:
Minimum, maximum, mean and median - daily, seasonal and annual
Variability
- (b) Stream velocity:
Minimum, maximum, mean and median - daily, seasonal and annual
Variability
Stream profile - vertical, longitudinal and X-section
- (c) Base flow
- (d) Flood flows:
Return frequency
Damage potential



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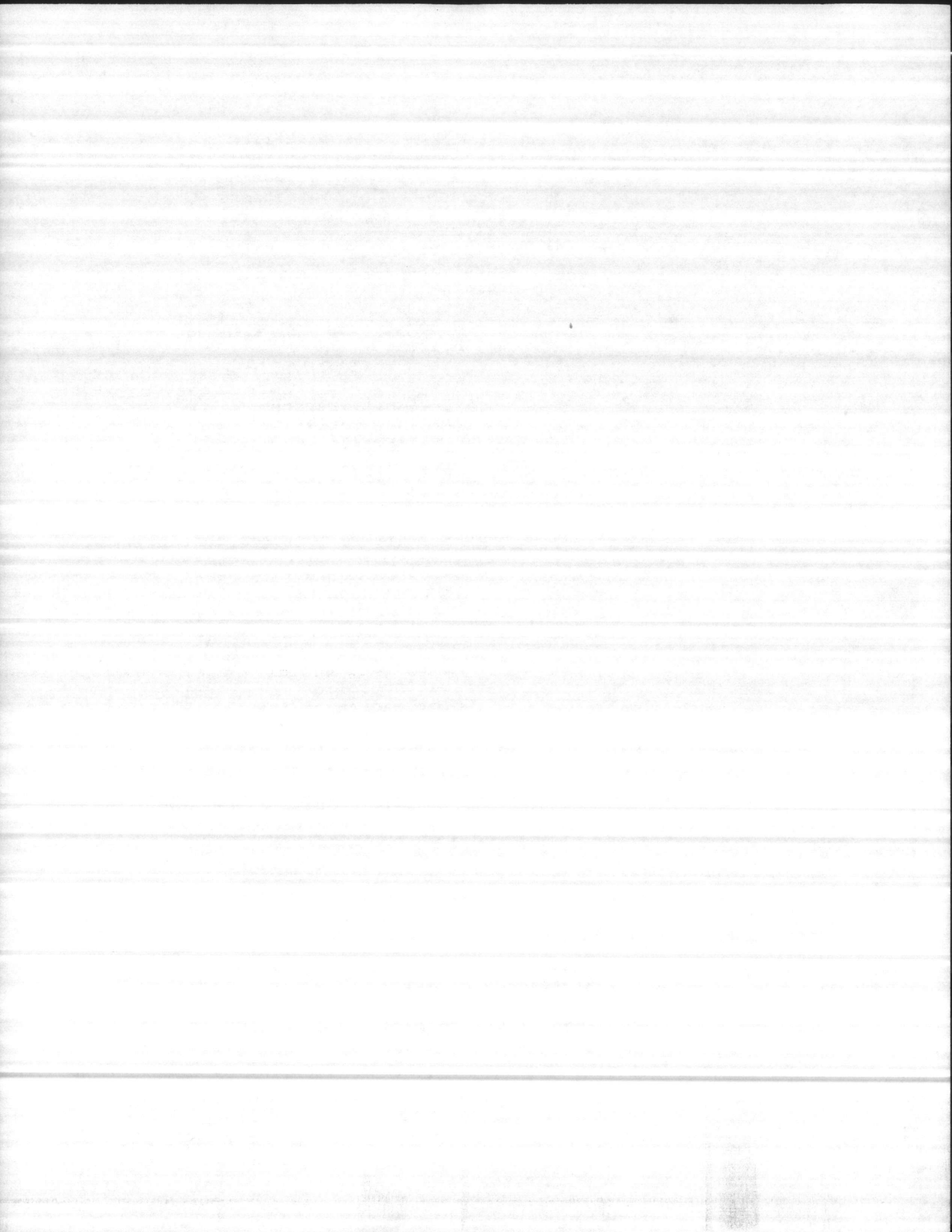
- (e) Stream channel characteristics; bottom materials, sedimentation
- (6) Oceanography
 - (a) Estuaries:
 - Volume of tidal flows; velocity profiles; type of tide
 - Salinity and temperature - variations
 - Tidal heights - minimum, maximum, and mean
 - Contributing sources
 - Mixing characteristics
 - Tidal prism in cubic feet at high, low and mean
 - (b) Harbor areas:
 - Tidal heights, minimum, maximum, mean, seasonal variations
 - Wave heights - return frequency
 - Oscillatory velocity currents
 - Turbulence; mixing characteristics
 - Storm damage return frequency analysis
 - (c) Beach stability and characteristics
 - (d) Water quality characteristics
 - (e) Bottom characteristics
- (7) Radioactivity (Refer to Nuclear Power Directorate (NAVSEA 08) for information and clearance,)
 - (a) Background levels and source discharge potential
- e. Land and Water Use
 - (1) Project Site Land-Use
 - (a) Present land use and land quality
 - (b) Zoning ordinance and official land-use designation
 - (c) Comprehensive long-range plan
 - (2) Area Water and Land-Use (Military and Civilian)
 - (a) Commercial and industrial:
 - Navigation-water and airways
 - Shell fish



- Commercial fisheries
 - Cooling-water dilution
 - Industrial processing
 - Extractive operations
 - (b) Transportation and utilities
 - (c) Residential
 - (d) Agricultural
 - (e) Vacant, sanitary landfill
 - (f) Municipal
 - (g) Recreational:
 - Water sports and fishing
 - Boating
 - Water fowl and wild life habitat
 - Refuges, wilderness areas, parks, wild-river zones
 - Camping, cabins, hiking
 - Field sports and playgrounds
 - (h) Historical and archeological sites
- (3) Water Quality
- (a) Minimum, maximum and mean concentrations - daily annual:
 - Concentration of critical constituents
 - Temperature profile - vertical, longitudinal and cross section
 - Sediment load - bed load, suspended solids
 - Floating solids, oils and grease
 - Color and turbidity
 - Taste and odor
 - Phosphate, nitrate and trace-minerals content
 - CO₂, O₂, N₂, H₂S
 - Detergents, organic content
 - Specific conductance, total dissolved solids
 - Background radioactivity (see d.(7))
 - Pesticides
 - Soluble organics
 - Toxic materials
 - pH

f. Area Biosystems of Interest

- (1) Identification of Pertinent Ecosystems and Habitat Associations



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- (2) Population Dynamics Endemic Species, Number, Variation, etc.
- (3) Quality of Wildlife
- (4) Endangered Species
- (5) Food Chain and Life Cycle; Seasonal Variations
- (6) Critical Inputs and Toxicity Levels, If Any.

B-5. ACTION FACTORS TO BE CONSIDERED, PROBABLE IMPACT

Factors which should be considered in assessing potential impact of various actions on environmental quality.

a. Transportation of Hazardous Materials

(1) Type of Danger Involved

- (a) Explosive
- (b) Flammable
- (c) Radioactive
- (d) Toxicity:
 - Liquid
 - Gaseous
- (e) Communicable diseases

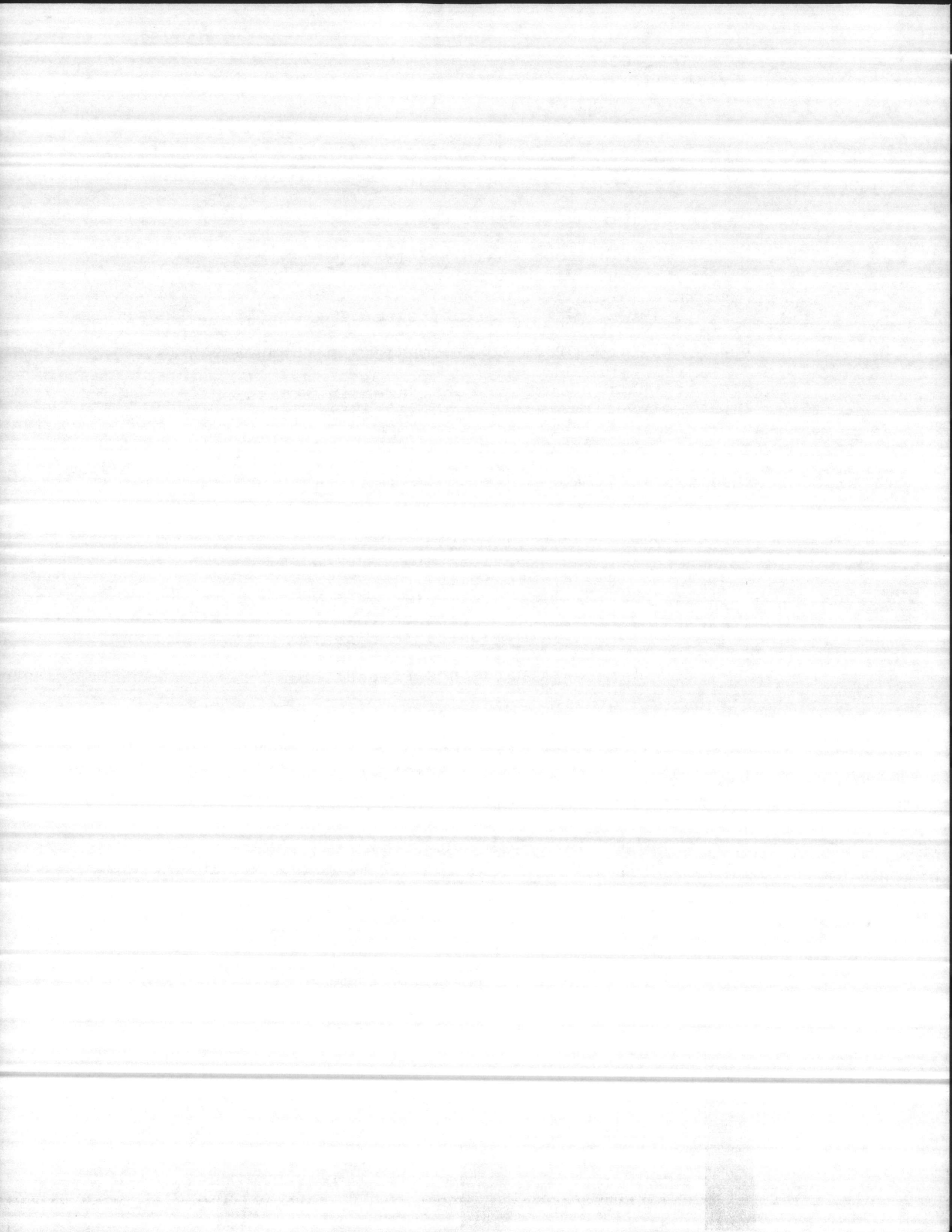
(2) Safeguards and Precautions

- (a) Safety precautions
- (b) Route selection, convoy
- (c) Monitoring
- (d) Backup systems

(3) Likelihood of an Incident

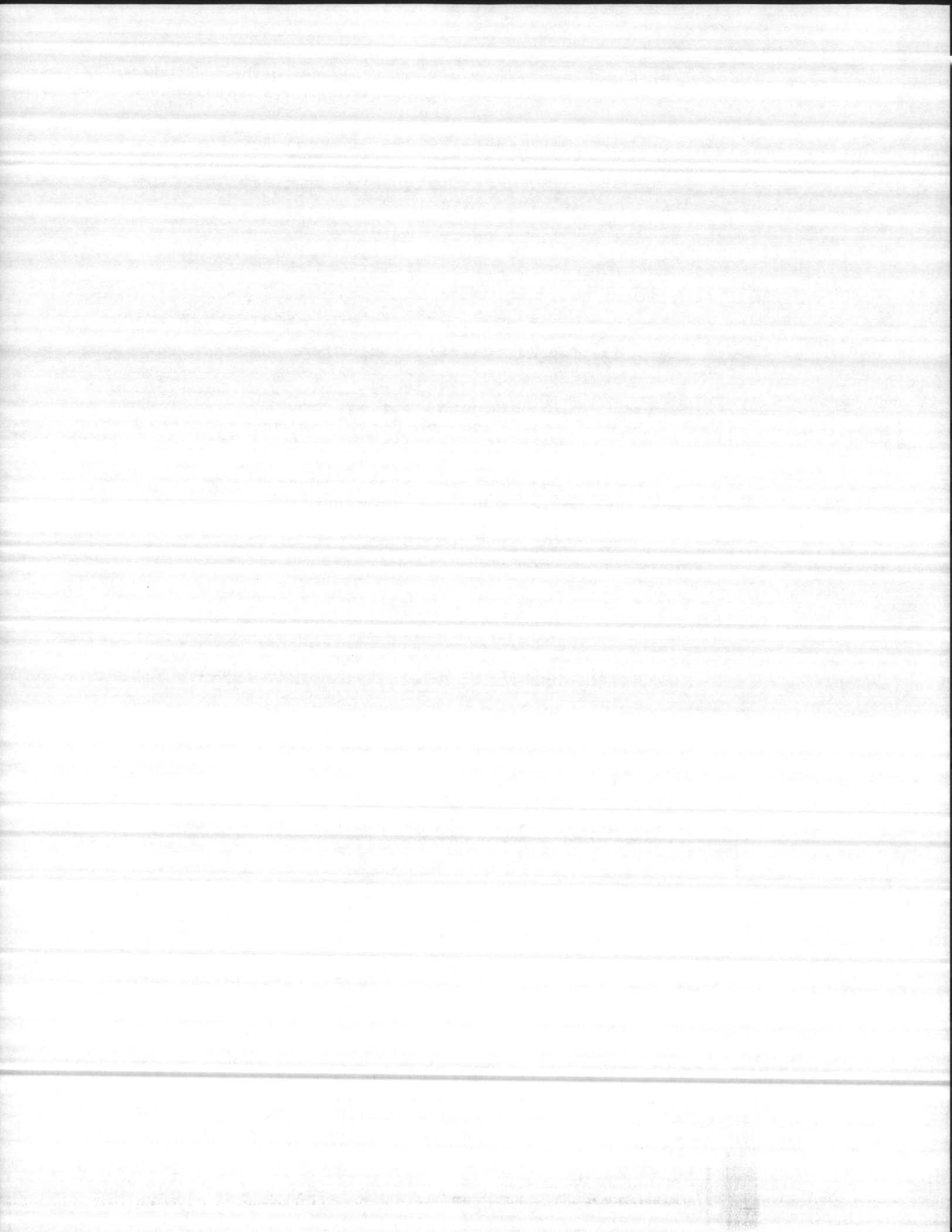
- (a) Previous history
- (b) Sequence or combination of events that will lead to an incident
- (c) Potential damage and mortality associated with an incident:
 - Military personnel
 - Military employees
 - Civilian population
 - Plant and animal life
 - Real property damage

(4) Emergency Procedures



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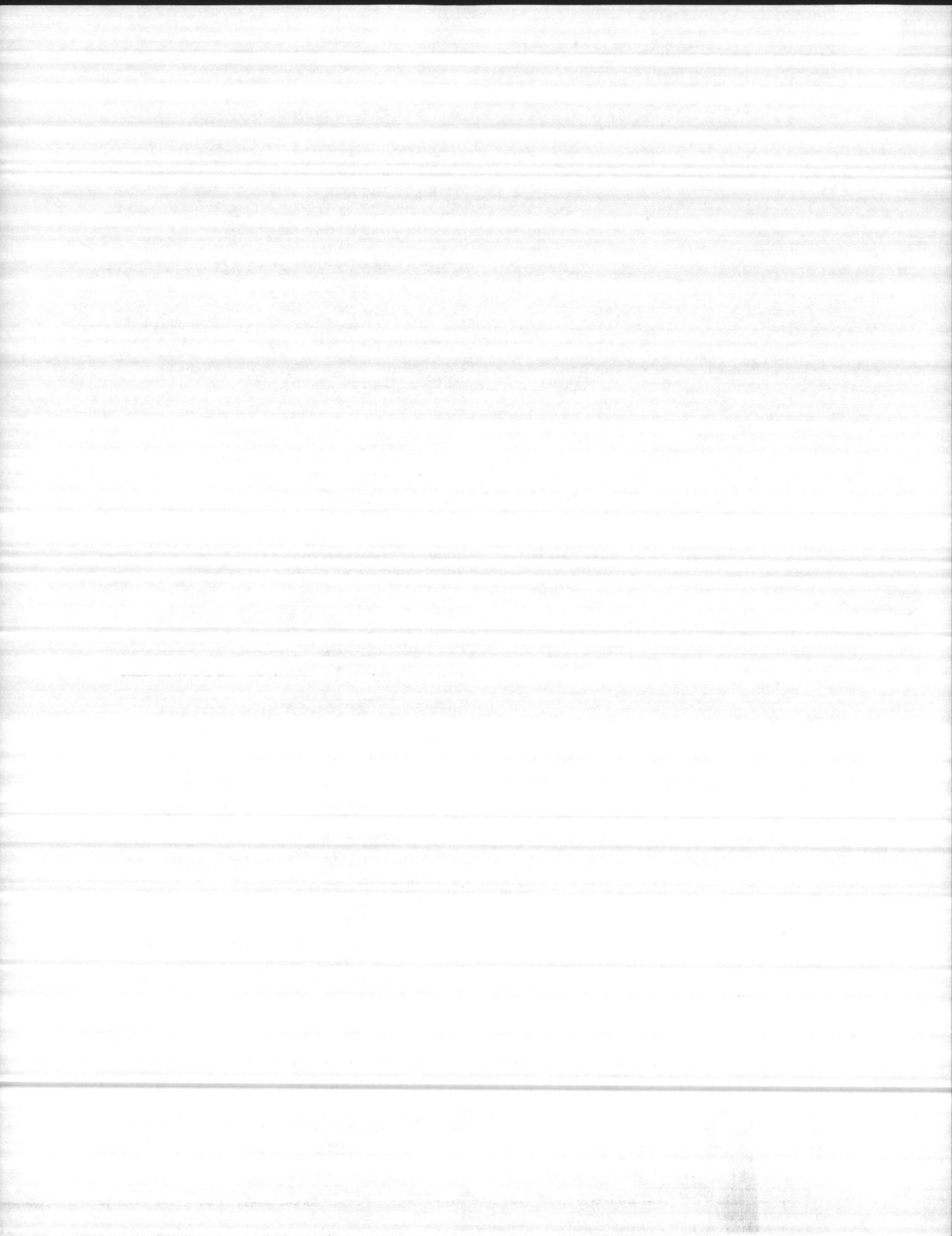
- (5) Alternatives
 - (6) Compliance with Local, State and Federal Regulations
 - (7) Controversy
- b. Resources Depletion
- (1) Relative Magnitude - Amounts to be Used
 - (2) Resource Being Depleted
 - (a) Groundwater; limited surface flows
 - (b) Mineral utilization
 - (c) Sand and gravel deposits
 - (d) Oil and petroleum products; natural gas, geothermal sources, and coal
 - (e) Archeological and historic sites
 - (f) Fish and game habitat
 - (g) Water fowl habitat
 - (h) Wet lands
 - (i) Beach lands
 - (3) Cost-Benefit Analysis
 - (4) Long-Term vs Short-Term Implications
 - (5) Alternatives
 - (6) Applicable State and Federal Regulations
 - (7) Possibility of Recycling or Restoration
 - (8) Controversy
- c. Emissions, Effluents, Solid Wastes, Noise
- (1) Airborne Emissions
 - (a) Sources at project site:
 - Automobiles, trucks, and buses
 - Open burning
 - Incinerators
 - Power generation; conventional and nuclear
 - Heating
 - Road-mix plants
 - Solvent use
 - Cooling towers



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Aircraft engine testing
Aircraft operations
Weapons training operations
Fire fighting school
Construction
Shipboard lagging of insulation
Propellant combustion

- (b) Parameters measured - minimum, maximum, mean, and variability:
SO_x, NO_x, CO, CO₂, O₂, and O₃
Hydrocarbons and photochemicals
Visible emissions; color, odor, etc.
Particulate matter
- (c) Point of discharge and diffusion characteristics - volume per time unit, plume heights, etc.
- (2) Waterborne Effluents
- (a) Sources at project site:
Domestic wastewater
Cooling water and cooling tower blowdown
Industrial wastewater; oils; processing fluids
Irrigation return - flow
Recreation return - flow
Runoff
Seepage from waste disposal operations
Accidental spills
Silt/silting
- (b) Treatment provided prior to discharge:
Chemical - precipitation, chlorination
Sedimentation, gravity separation
Filtration
Aeration
Aerobic bacterial treatment
Anaerobic bacterial treatment
Long-term holding
Heat treatment
Sonic treatment
Radioactive treatment



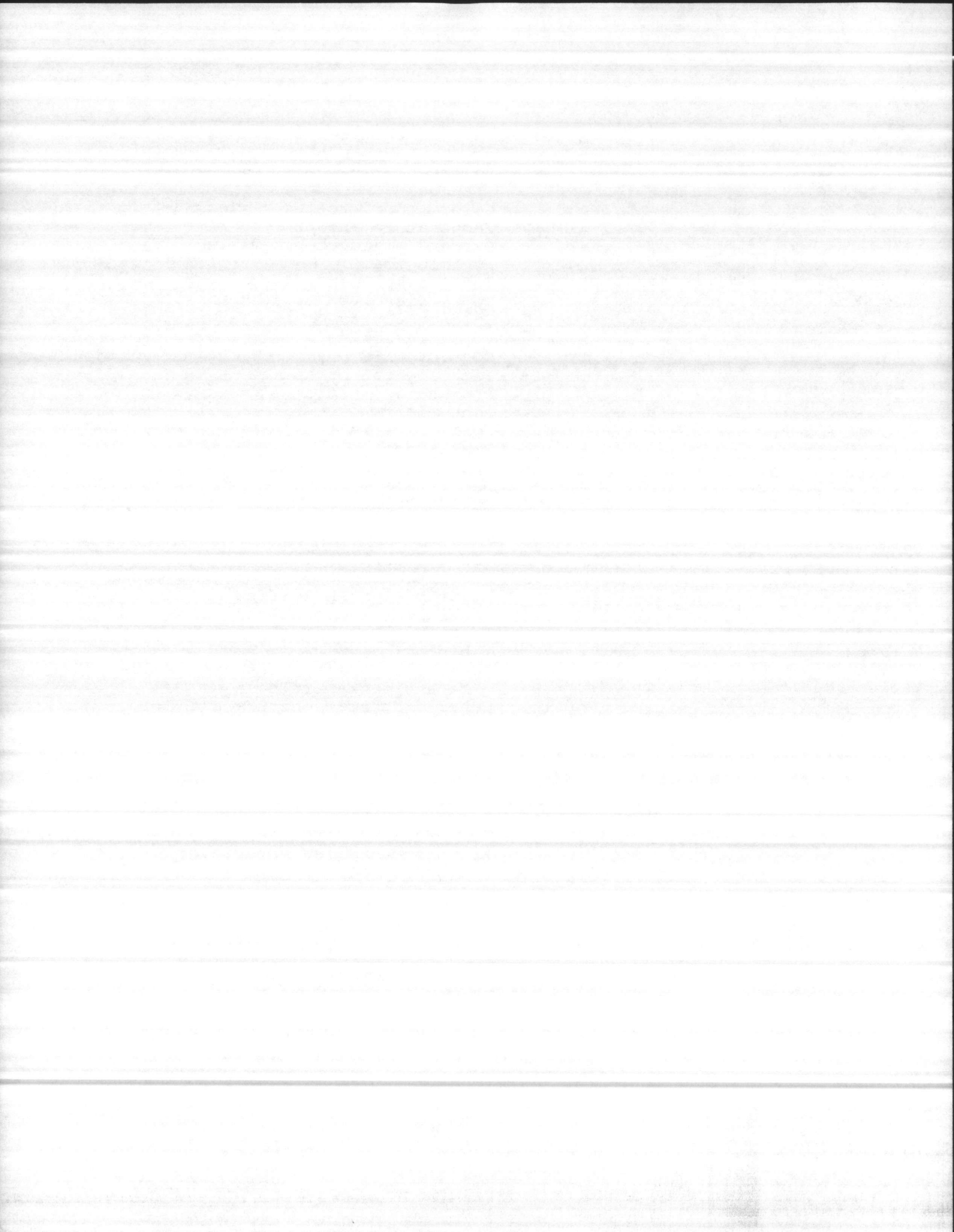
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- (c) Physical and chemical characteristics -
minimum, maximum, mean, variability:
Volume-hourly, daily, seasonal,
annual
Color, odor, taste, turbidity
Temperature and pH
Oxygen demand-chemical and
biological
Total suspended solids
Total dissolved solids,
conductivity
Volatile solids
CO₂, O₂, H₂S
Pathological organisms
Phosphates, nitrates, trace
nutrients
Toxic materials
Pesticides
Floating solids, oils, grease
Detergents
Radioactivity
Heavy metals

- (d) Point of effluent discharge:
Characteristics of receiving water
Distribution and diffusion; mixing
vertical and longitudinal
Reactivity potential; chemical and
biological
Possibility of serious damage due
to accidental release
Other discharges-nature and
quantities

(3) Solid Wastes

- (a) Sources at project site:
Domestic sources
Commercial and industrial
Weapons packaging materials;
disposal of
Hospital
Mineral wastes
Agricultural wastes
Incinerator wastes
- (b) Characteristics of wastes - minimum,
maximum, mean, and variability:
Pathogenic
Organic content-combustibles,
NH₃ volatile fractions



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Moisture content
Oils and greases
Density
Volume -- daily, weekly, seasonal,
annual
Recycle and salvage potential
Radioactive materials and
contaminated equipment
Explosive materials

(c) Point of discharge:

Physical state; collection
procedure and state
Method of transportation
Intended site for disposal
Characteristics of disposal site
Possibility of serious damage or
health hazard being created by
accidental release

(4) Noise Emissions

(a) Sources at project site:

Construction equipment
Drilling and blasting
Motor vehicles
Aircraft operation and testing
Watercraft operations
Weapons testing
Industrial processing

(b) Noise levels - maximum, mean,
variability:

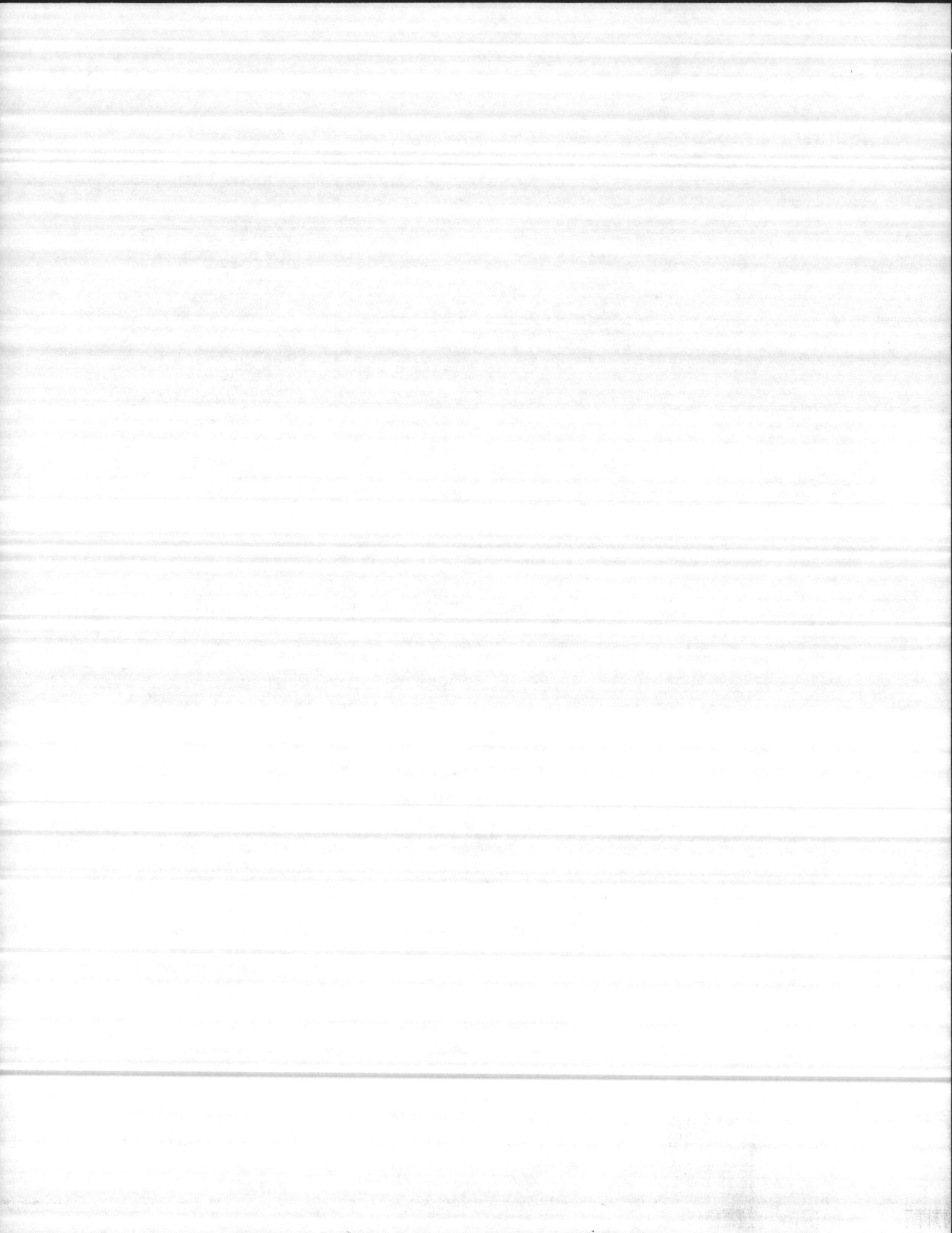
At the project site
Closest non-military personnel
Duration of project
Duration of noise at each level
indicated
CNR designation

(5) Alternatives to Uncontrolled Emissions, etc.

(6) Compliance with Local, State and Federal
Standards and Regulations

d. Pesticides

(1) Purchase and Procurement



- (a) Selection
 - (b) Effect on non-target organisms
- (2) Storage and Transport
- (a) Effect on humans
 - (b) Precautions and security
- (3) Operations Effects
- (a) Application methods
 - (b) Fumigation
 - (c) Wood preservation and treatment
 - (d) Aerial dispersal
 - (e) Soil treatment
 - (f) Disposal

e. Radiation

(1) Sources

- (a) Power generation:
 - Reactor operation
 - Fuel cell reprocessing
 - Radioactive waste handling
- (b) Weapons testing
- (c) Occupational exposure in laboratories and training facilities

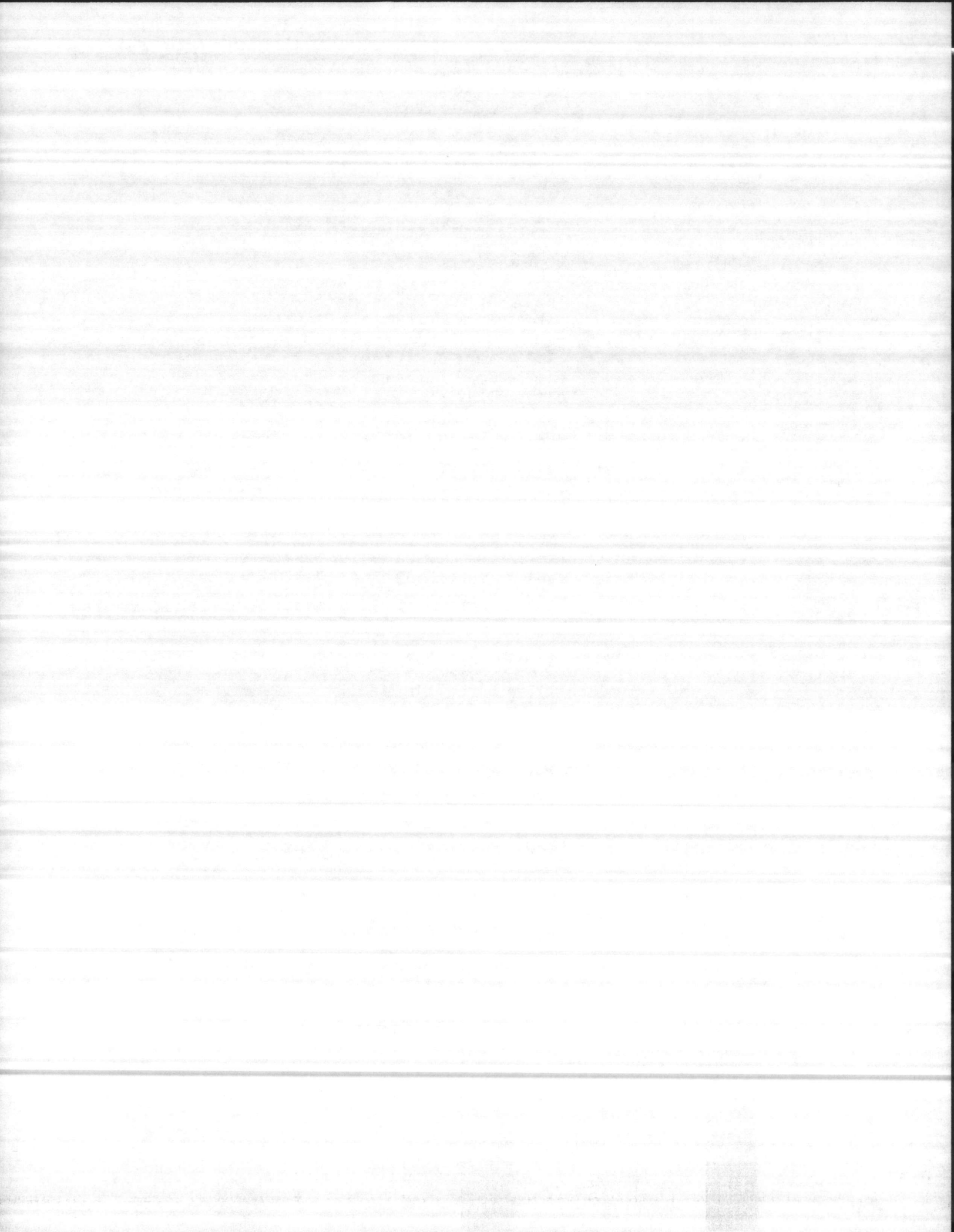
(2) Source Characteristics

- (a) State:
 - Solid, liquid, gaseous
 - Radioactive particle
 - Energy emission
- (b) Half-life
- (c) Activity level
- (d) By-products - secondary effects

(3) Safeguard and Control Procedures

(4) Likelihood of an Incident

- (a) Previous history
- (b) Sequence or combination of events that will lead to an incident
- (c) Possible property damage
- (d) Possible exposure of military personnel and employees



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- (e) Possible exposure of civilian population

f. Water and Land Use Implications

(1) Uses with Potential Adverse Implications

- (a) Storage of hazardous materials
- (b) Disposal of hazardous materials
- (c) Operations near residential areas, safety zones
- (d) Operations that restrict or preclude recreational use of public lands, beaches and waterways
- (e) Construction of new facilities:
 - Added traffic congestion in the area
 - Significant population density changes
 - Reduction of park and recreation facilities
 - Radical changes in architectural norm
- (f) Industrial processing normally associated with noise, air pollution and water pollution
- (g) Creation of blighted and slum areas by abandonment of facilities and installations

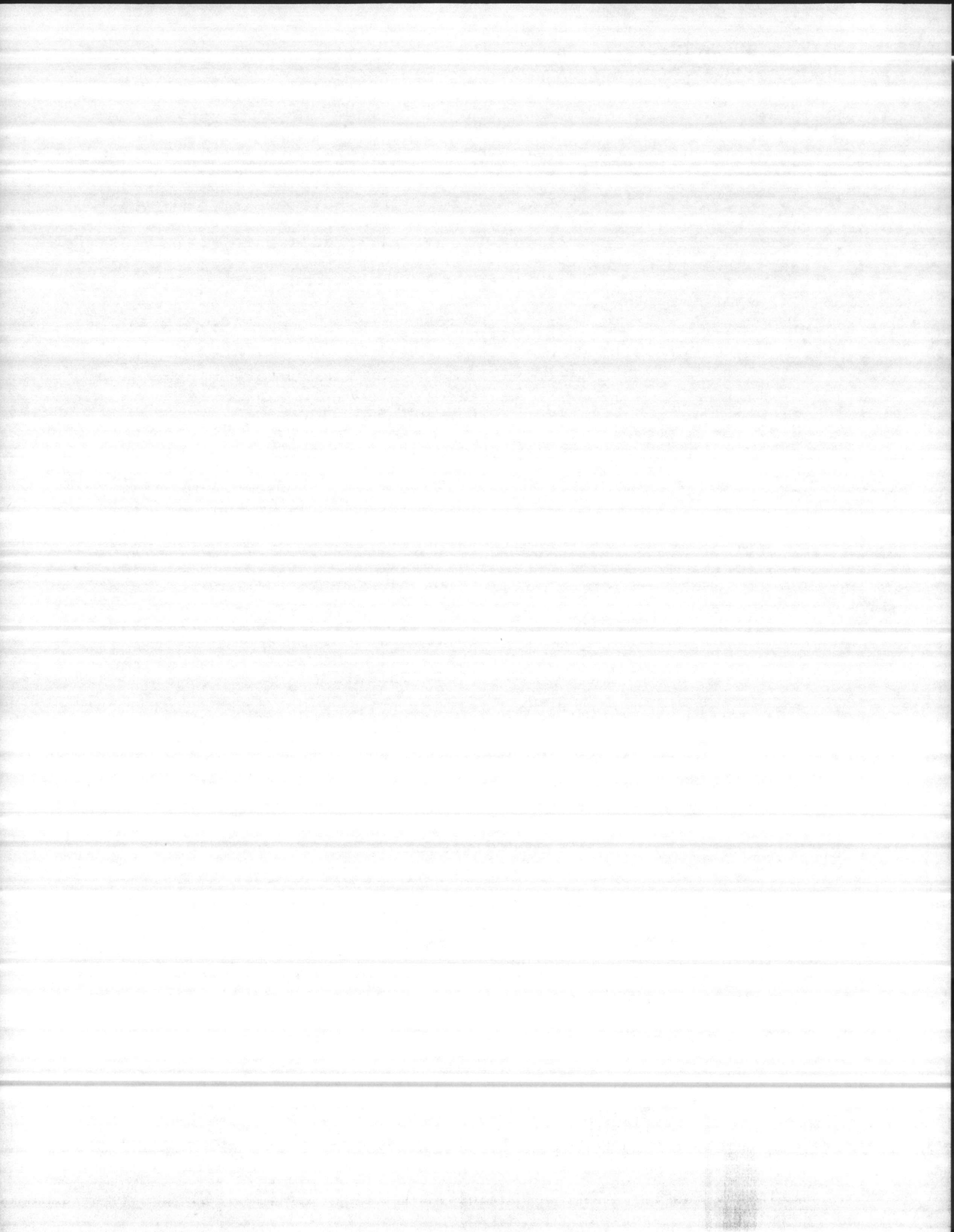
(2) Compliance with Local Code

- (a) Housing and building
- (b) Subdivision
- (c) Zoning

(3) Agreement with Long-Term Regional Master Plans

(4) Alternatives

(5) Long-Term Versus Short-Term Implications



B-6. UNAVOIDABLE ENVIRONMENTAL IMPACT

Various categories of environmental impact which may occur as a result of specific actions or sequence of actions.

a. Noise Pollution

(1) Health and Welfare Significance

- (a) Exposure of station/ship personnel to potentially hazardous noise levels
- (b) Exposure of civilian communities to annoying noise levels resulting from:
 - Aircraft operations
 - Aircraft maintenance
 - Industrial noise
 - Vehicular noise resulting from changes in traffic density
- (c) Anxiety of civilian community over aircraft safety manifested by noise complaints

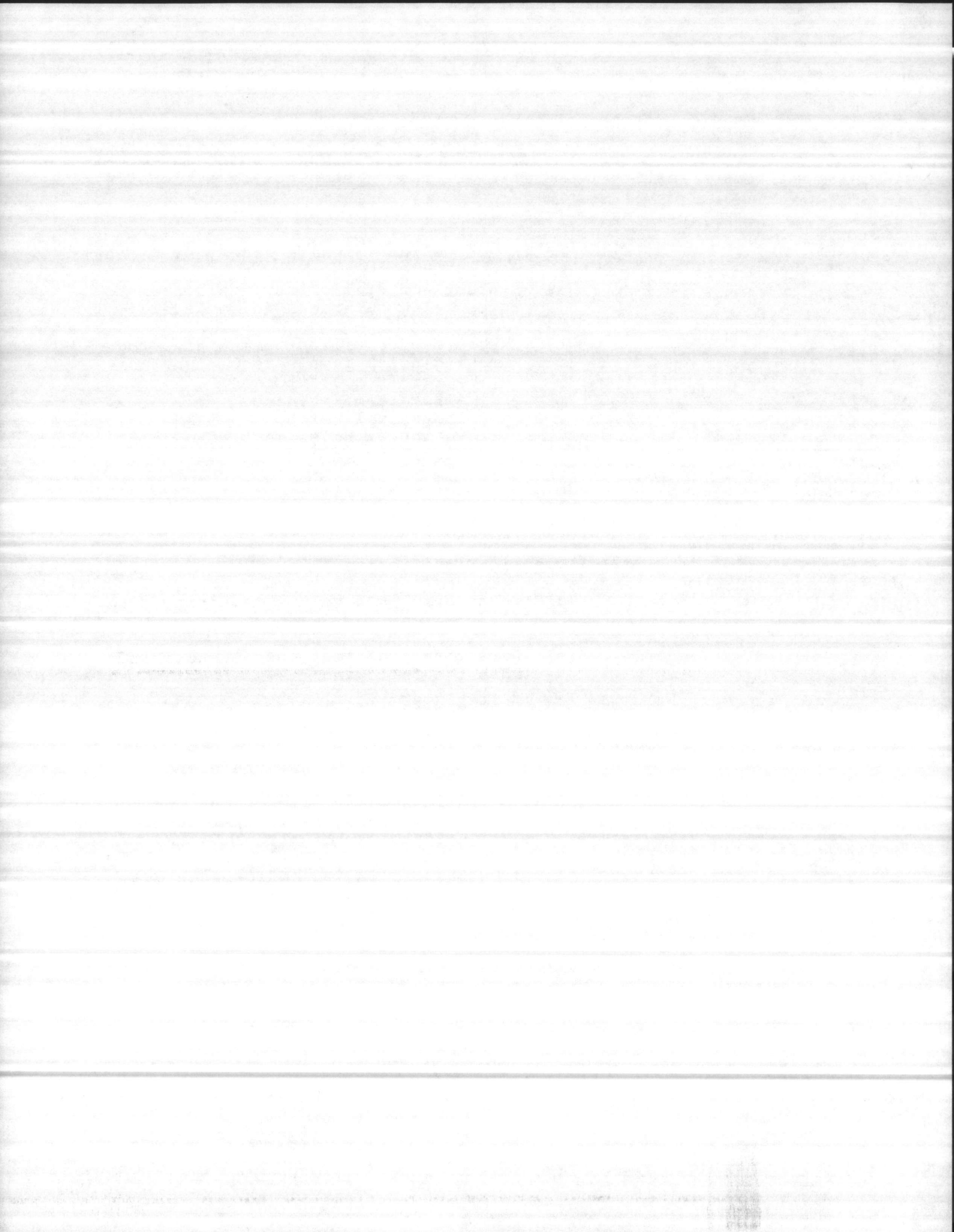
(2) Economic Significance

- (a) Changes in land values resulting from (1) (b)
- (b) Direct and indirect costs associated with the following:
 - Litigation
 - Public relations
 - Noise surveys (one-time and continuing)
 - Noise control and abatement "fixes"
 - Relocations of equipment, personnel and/or facilities to take advantage of natural sound barriers
 - Changes in job performance due to changes in noise levels

b. Water Pollution

(1) Health Significance

- (a) Transmission of pathogenic disease: Potable water supply



Shellfish
Bathing and recreation waters
Vegetables and irrigated crops

(b) Toxic materials in potable supply:
Pesticides and herbicides
Heavy metals; arsenic, cyanides,
sulfides
Nitrates
Fluorides

(c) Taste and odor in potable supply

(2) Effects on Aquatic Life

(a) Direct effects:

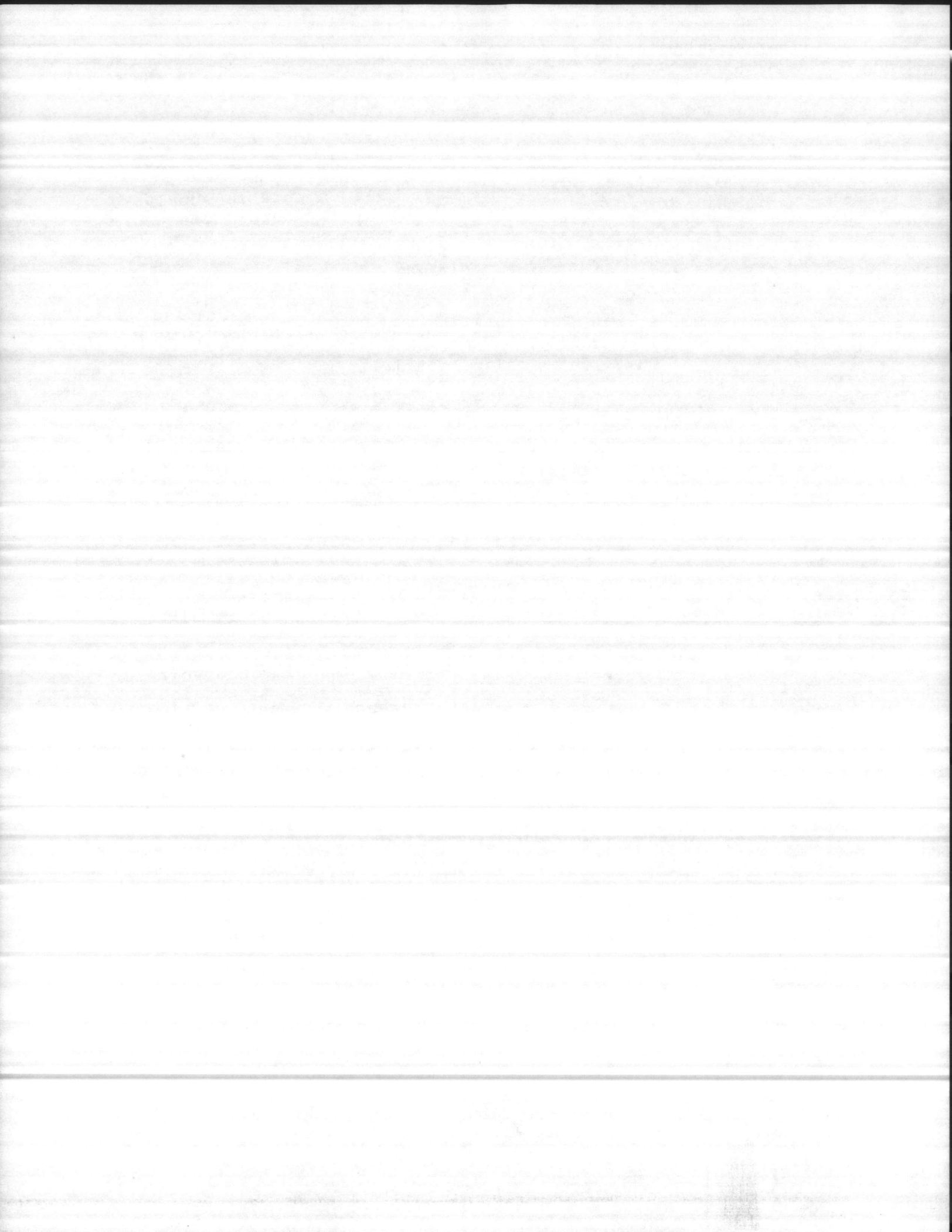
Growth stimulated by addition of
nutrients such as phosphates,
nitrates, CO₂ and trace
elements
Elimination or growth impeded by
limiting factors such as
minimum oxygen tension, maximum
temperature, color, pH range,
NH₃, NO₂, and turbidity
Toxicity of materials such as
heavy metals (copper, zinc,
silver, lead, mercury),
detergents, chlorinated hydro-
carbons, and oils and volatile
petroleum based materials
Interference with aquatic life by
suspended solids, turbidity and
color
Disruption of the life cycle of
aquatic life
Silt/silting

(b) Indirect effects:

Food chain interruption
Inhibition or stress during some
phase of the life cycle
Habitat destruction
Change in competitor relationship
Change in predator relationship

(3) Aesthetics

(a) Loss of sense of well-being



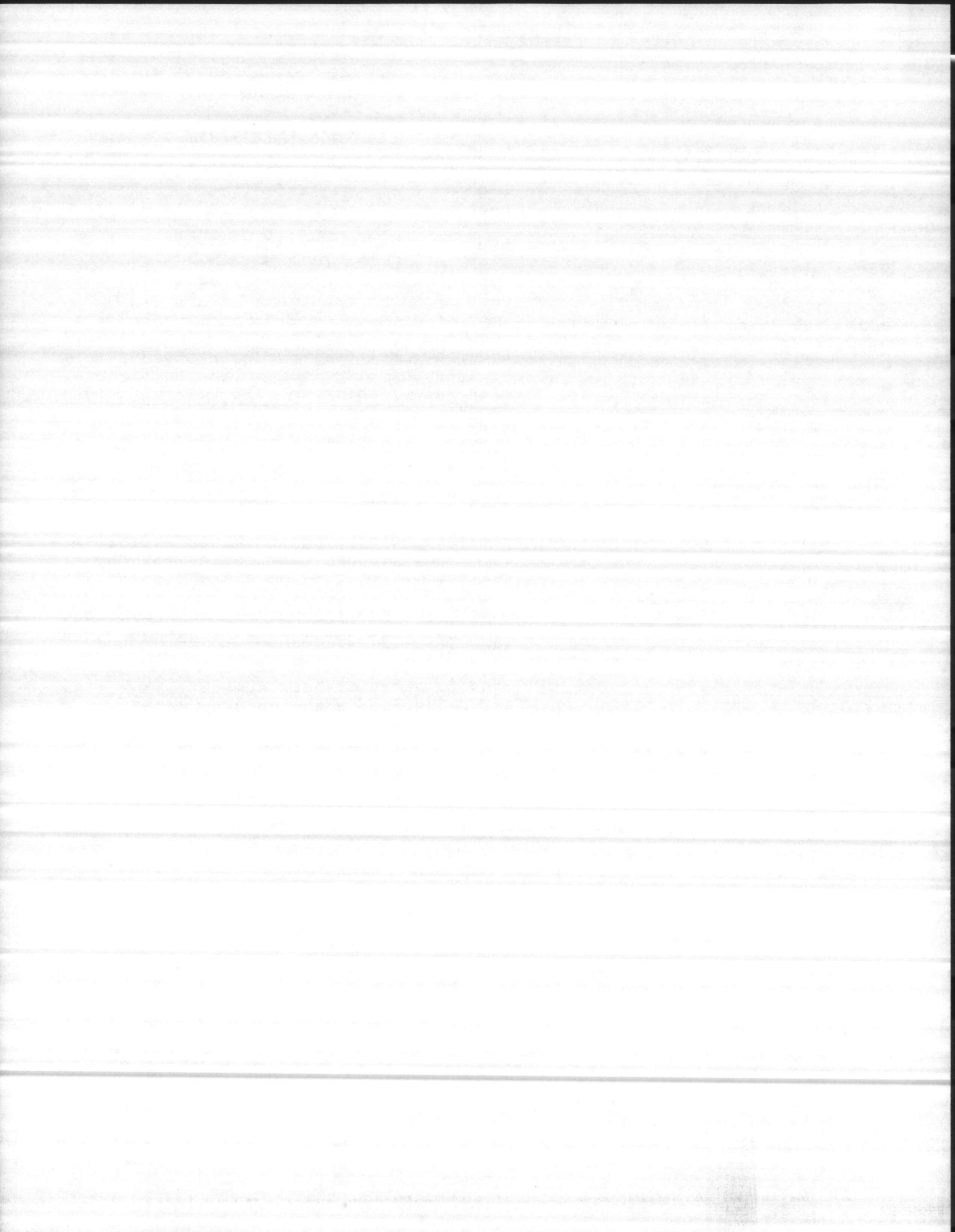
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- (b) Loss of confidence in society to cope with problems
 - (c) Lending credit to a feeling of ugliness that prevails in large urban areas
- (4) Economic
- (a) Loss to commercial fisheries
 - (b) Cost of water treatment before use
 - (c) Cost of developing alternate water supplies
 - (d) Lower agricultural productivity due to build-up of dissolved solids in irrigation water; shift to salt tolerant crops
 - (e) Loss of reservoir capacity due to sediment deposition
 - (f) Loss of use of a natural resource
- (5) Recreation
- (a) Pleasure of boating and water skiing is diminished due to floating solids, gas bubbles, odors and algae blooms
 - (b) Closing of public beaches and swimming areas because of potential disease transmission
 - (c) Loss to sport fishers due to fish kills and reduction in the population of quality fish by pollution, with more resistant trash fish replacing them
 - (d) Smaller wildlife and water fowl populations

c. Air Pollution

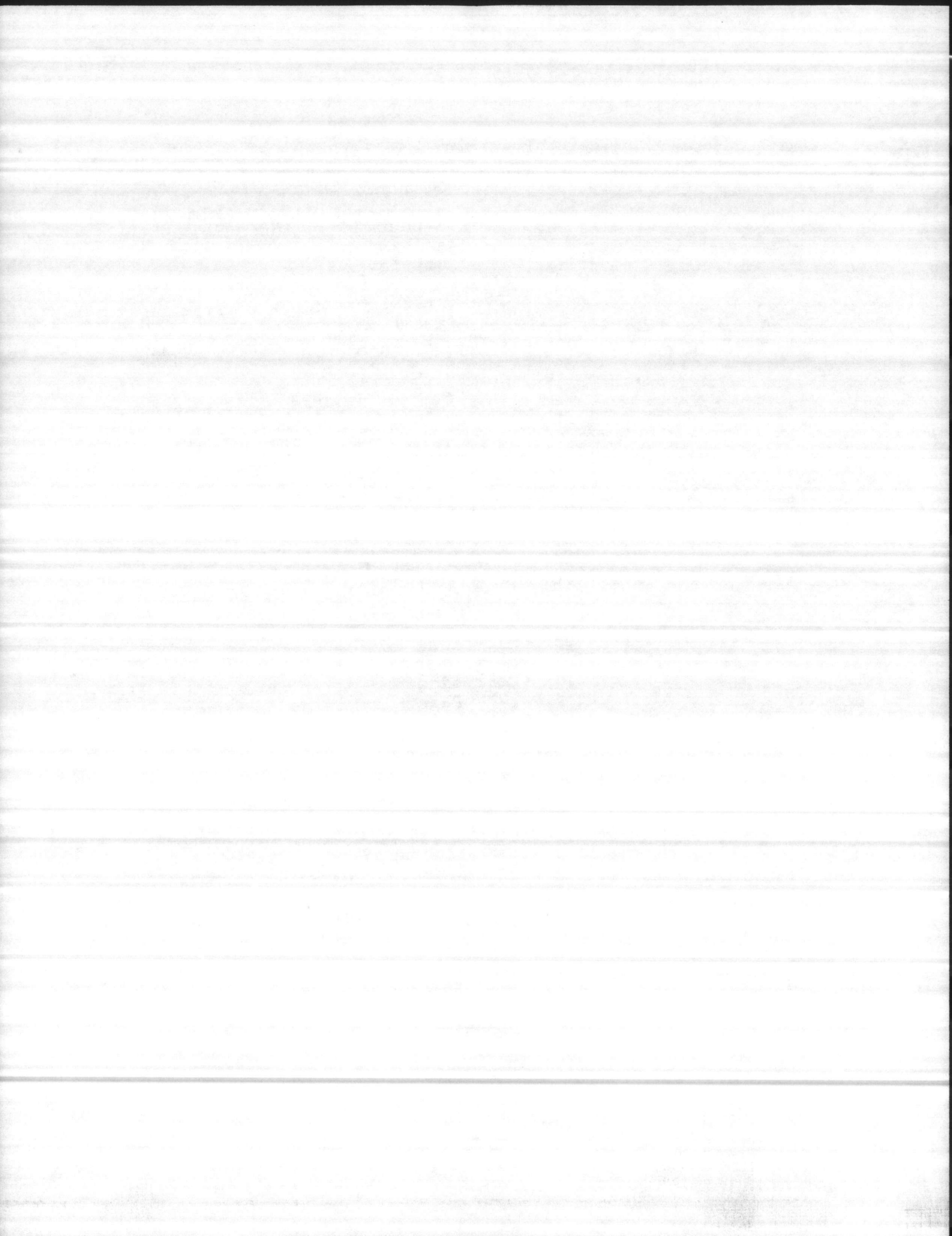
(1) Health Significance

- (a) Increased death and illness rates:
SO_x, NO_x, and particulates with relative levels of each important overall health effect
Linked with high mortality rates due to cancer and arteriosclerotic heart disease



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- (b) Increased incidence of chronic disease:
 - Emphysema
 - Bronchitis
 - Other respiratory ailments compounded by lung tissue damage
 - Allergies
 - Hay fever
 - (c) Eye irritation, nose irritation
 - (d) Reduced visual and mental acuity
 - (e) Toxic materials:
 - Carbon monoxide-O₂ replacement in blood
 - Beryllium - lung lesions
 - Asbestos - lung scarring and lung cancer
 - (f) Increased susceptibility to disease
 - (g) Loss of sense of well-being
 - (h) Nuisance problems created-odor, visibility loss
- (2) Economic Significance
- (a) Corrosion and material deterioration:
 - Paint darkening and peeling
 - Metal corrosion
 - Rubber cracking
 - Erosion of building faces and statuary
 - Color deterioration
 - (b) Soiling of food, clothes, automobiles and structures:
 - Cleaning costs
 - Dyeing costs
 - Loss of prepared and canned foods
 - Time, utilization and replacement costs
 - (c) Vegetation and animal life:
 - Tree and orchard blight
 - Crop losses (particularly for leafy vegetables)



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Chronic plant injury and chronic
animal diseases
Loss of incoming radiation needed
for plant growth

(d) Increased accident costs

(3) Aesthetic Loss

- (a) Visibility loss
- (b) Generation of smog and haze
- (c) Scenic beauty and skyline obscured

(4) Climatic Changes

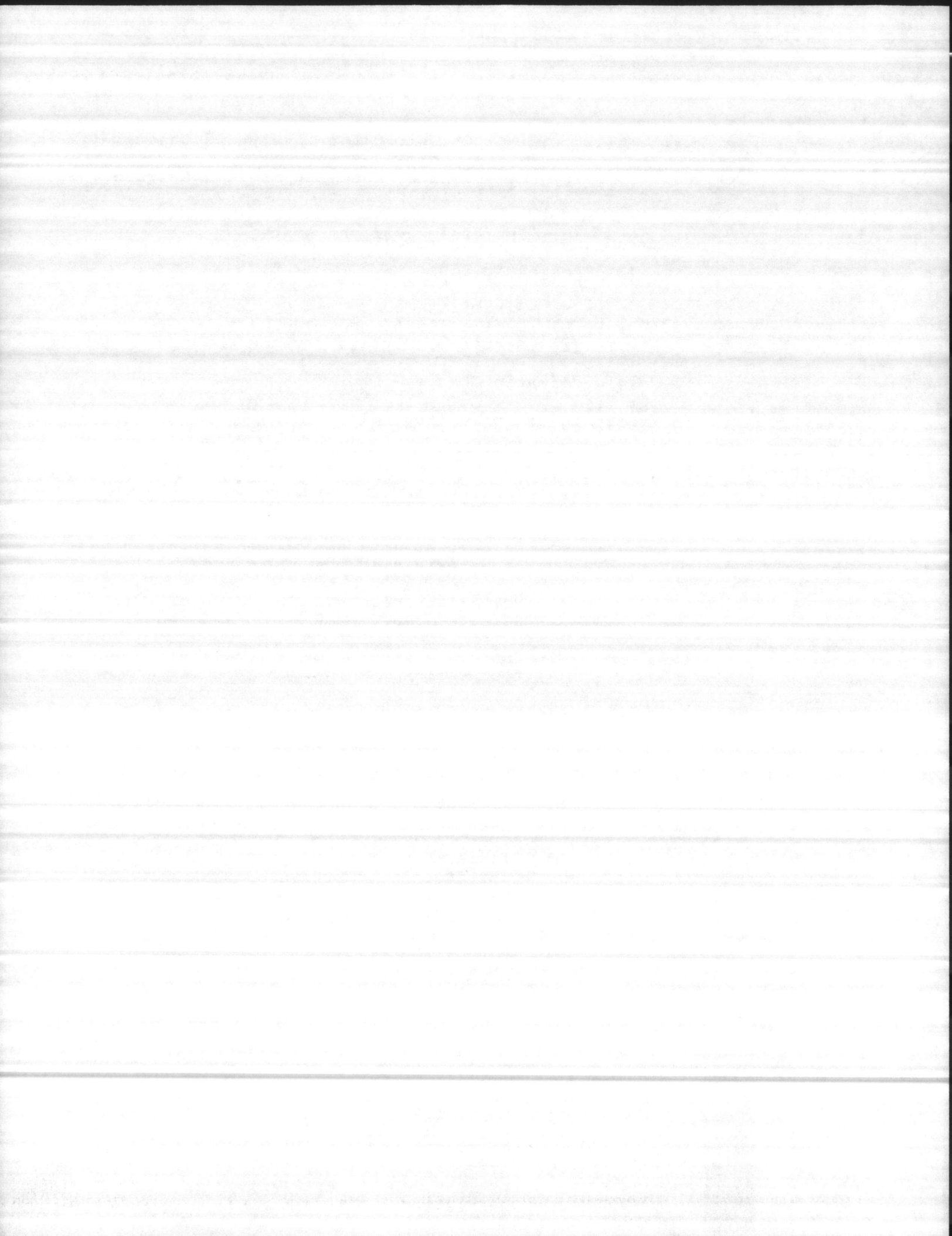
d. Release of Toxic Materials

(1) Health Significance

- (a) Exposure of humans to toxic levels due to accidental release
- (b) Chronic effects due to concentration of materials in the human body
- (c) Potential increased incidence of birth defects, genetic mutation and cancer
- (d) Concentration to toxic levels via the food chains
- (e) Fear of certain food because of possible contamination

(2) Biological

- (a) Elimination of some species because of toxic effects
- (b) Elimination of some species because of introduction of stress or weakening of the species during some phase of the life cycle
- (c) Changes in variety and population in the ecosystem
- (d) Selective breeding of resistant species
- (e) Change of predatory and parasite relationships



- (f) Severe leveling of population numbers
- (3) Aesthetic and Recreational
 - (a) Loss of recreational opportunities:
 - Elimination of certain species
 - Over-production of certain species
 - (b) Development of large populations of nuisance organisms:
 - Taste and odors
 - Color
 - Suspended biomass

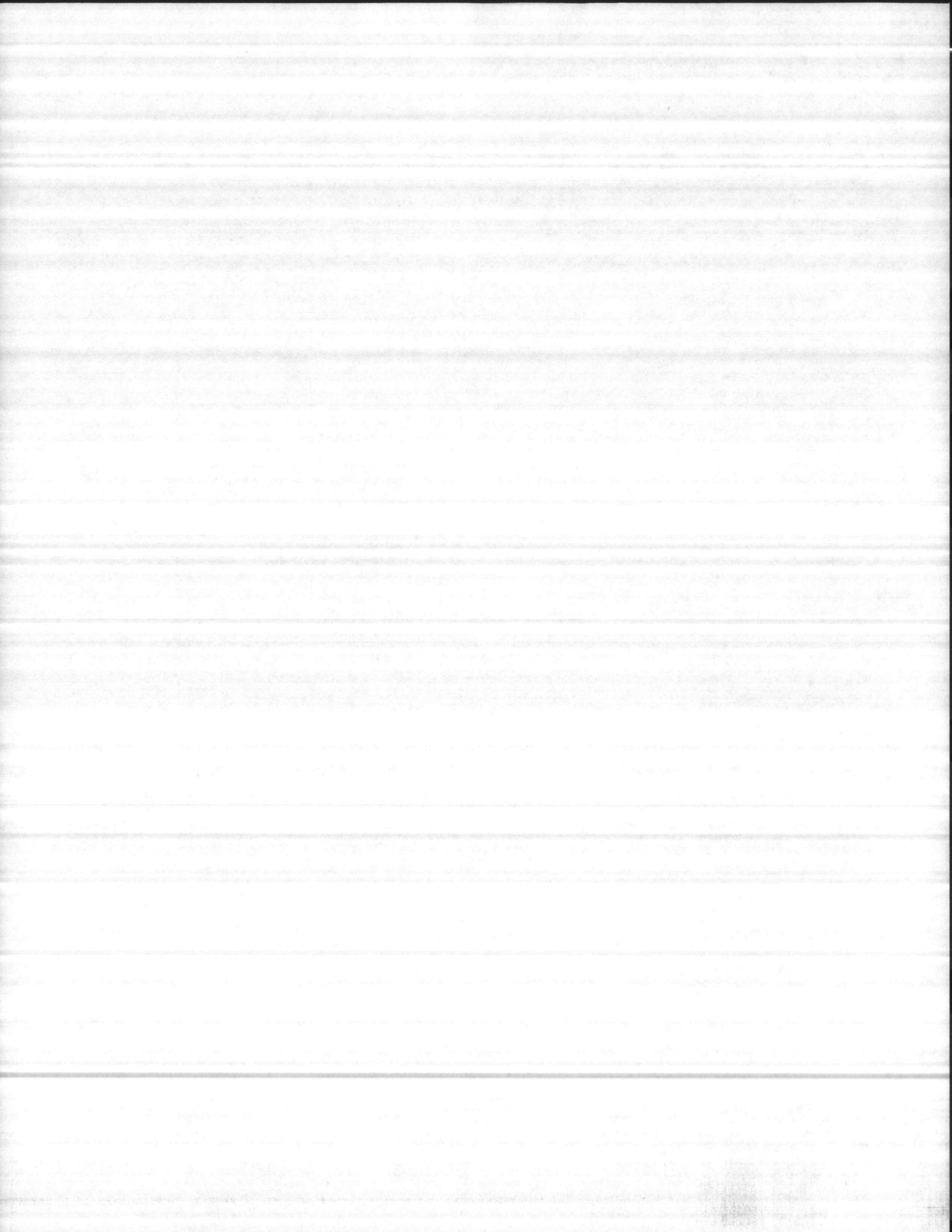
e. Adverse Land and Water Use

(1) Sociological

- (a) Urban congestion:
 - Loss of some of the amenities of life
 - Loss of diversity and opportunity for individualism
 - Development of high crime rate areas
- (b) Failure to include social costs could lead to ineffective projects that do not operate as intended, breakdown of public sector functions
- (c) Loss of sense of "home" to the urban dweller in certain types of housing developments
- (d) Loss of open areas and recreational facilities
- (e) Lack of adequate low cost housing in certain urban areas
- (f) Development of low tolerance to changes in lifestyles and increased impatience with interfering agents

(2) Health Significance

- (a) Increased need for sanitation facilities
- (b) Increased generation of solid wastes



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- (c) Increased need for sector control
- (d) Tensions due to increased tempo of life and increased stress
- (e) Creation of anxiety

(3) Aesthetic

- (a) Loss of sense of well-being in the community
- (b) Creation of an atmosphere of ugliness
- (c) Depreciation of the quality of life

(4) Economic

- (a) Tax burden shifts:
 - Loss of property as a revenue source
 - Increase in obligations to provide community services

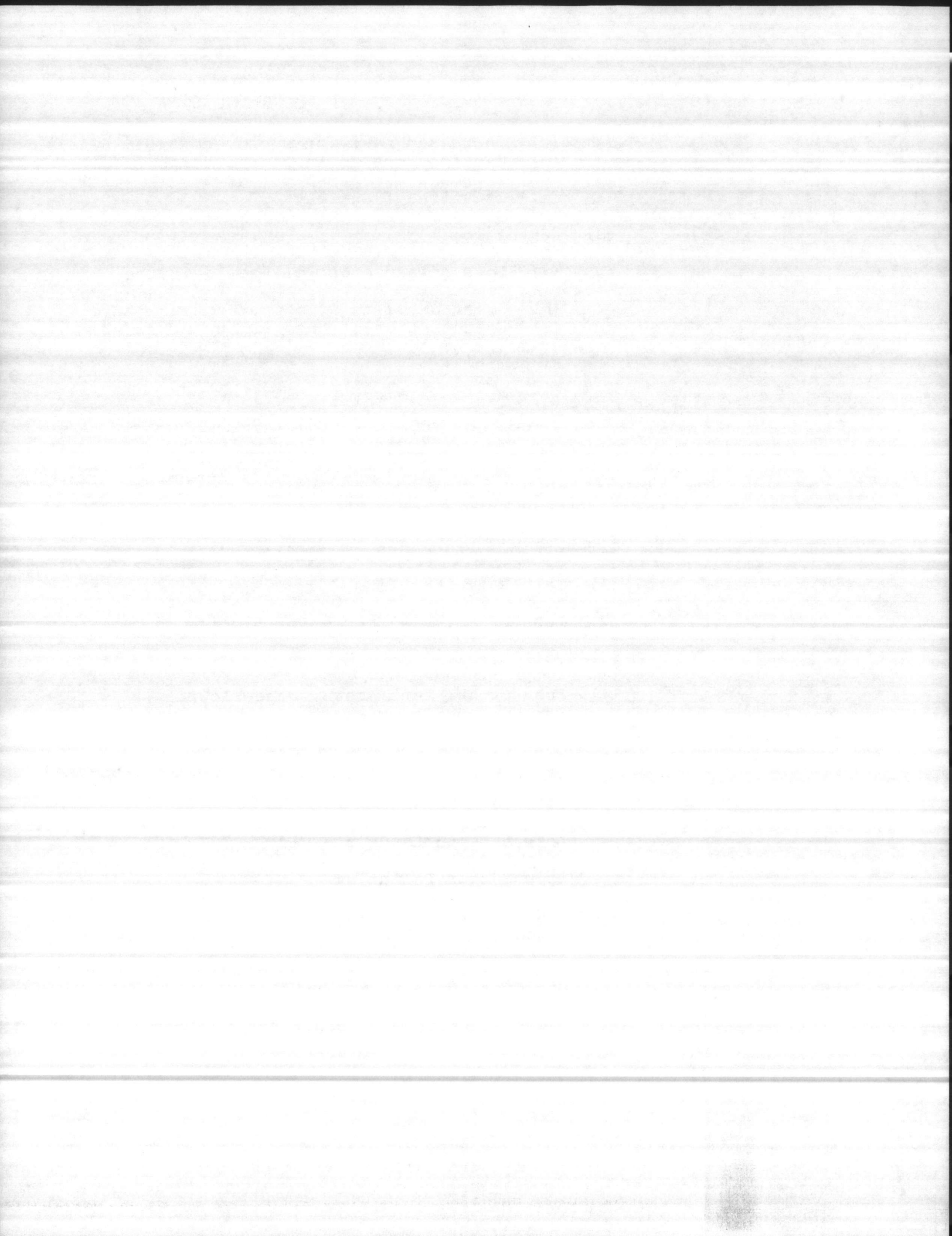
B-7. NATURAL RESOURCE DEPLETION

a. Irreversible Processes

- (1) Lake Eutrophication
- (2) Loss of Certain Species of Biolife
- (3) Soil Erosion
- (4) Loss of Wet-Land Areas, Free-Flowing Streams and Canyons
- (5) Loss of Cold Regions Tundra
- (6) Permanent Modifications of Weather and Climate
- (7) Loss of Open Lands and Vista
- (8) Groundwater Pollution

b. Slow Regeneration Processes

- (1) Timber Harvesting
- (2) Overgrazing of Land
- (3) Overproduction of Groundwater in Excess of Recharge



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- (4) Temporary Change in the Ecosystem to Favor Certain Species

c. Economic

- (1) Cost of Developing Alternate Resource Due to the Depletion of Certain Resources
- (2) Long-Term Versus Short-Term Economic Considerations Where Viewed From Position of Long-Range National Goals Versus More Restricted Objectives

